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CROWN GALL OF WOODY PLANTS IN FLORIDA

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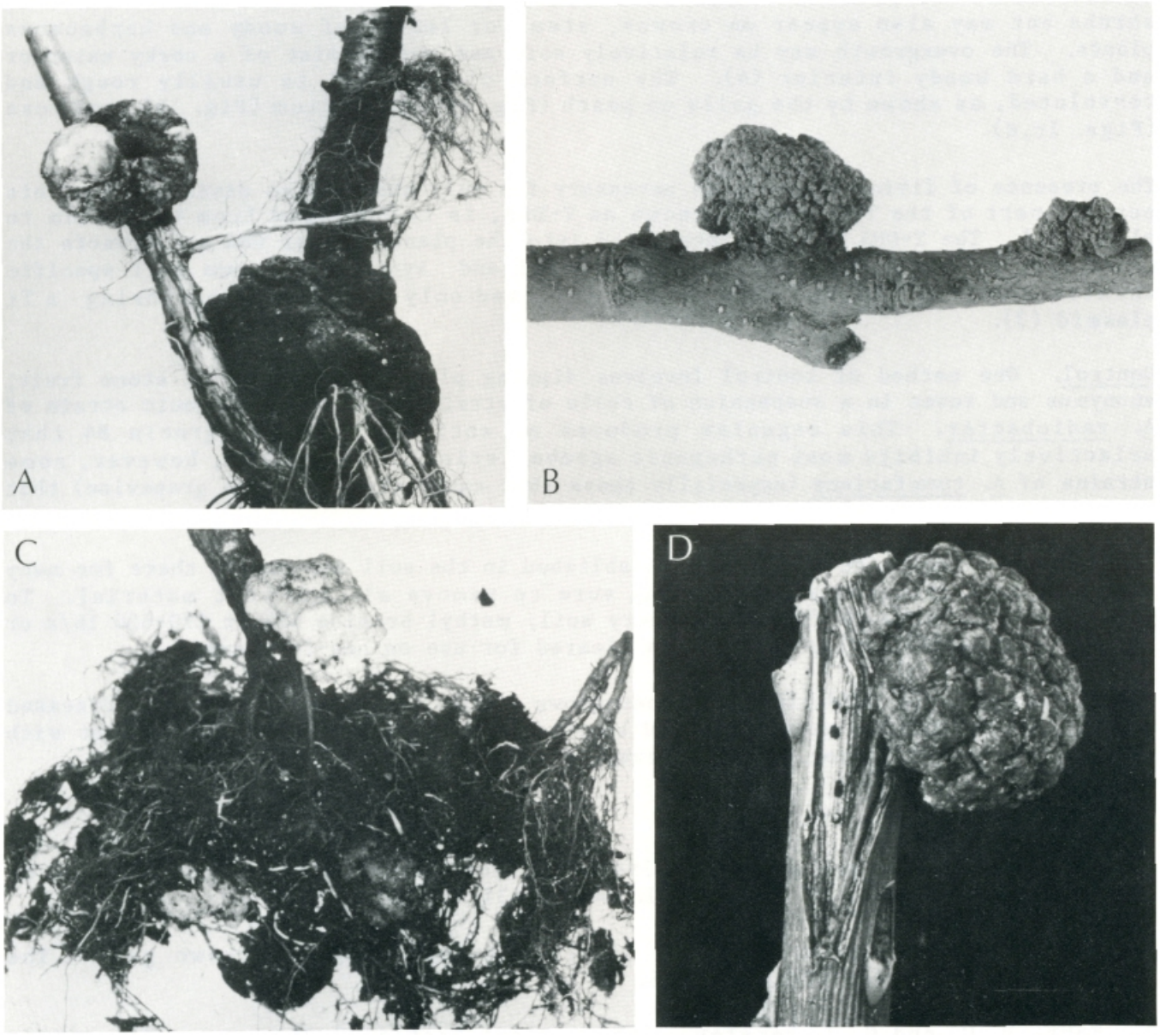

Fig. 1. Crown gall caused by Agrobacterium tumefaciens on (a) peach, (b) ligustrum, and (c,d) rose.

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The crown gall organism, Agrobacterium tumefaciens (Smith & Townsend) Conn., has a very large host range including 643 species of plants belonging to 331 genera and 93 families (2). There are three recognized biovars of this organism, based on pathogenicity. Biovar 1 has a very wide host range, whereas Biovar 2 is commonly found on stone fruits and Biovar 3 on grapevine (1).

Symptoms. Crown gall consists of overgrowths varying from the size of a pea or smaller to 50 lbs or more. Galls occur commonly on subterranean roots of trees or shrubs but may also appear on crowns, stems or leaves of woody and herbaceous plants. The overgrowth may be relatively soft and may consist of a corky exterior and a hard woody interior (4). The surface of the gall is usually rough and convoluted, as shown by the galls on peach (Fig. la), ligustrum (Fig. lb), and rose (Figs. lc,d)

The presence of living bacteria is necessary for only about three days. During this period, part of the Ti plasmid, known as T-DNA, is transferred from bacterium to plant cell. The T-DNA becomes integrated into the plant nuclear DNA and directs the plant cell to grow and divide out of control and synthesize crown gall specific chemicals called "opines" which can be utilized only by bacteria harboring a Ti plasmid (3).

Control. One method of control involves dipping planting material of stone fruit, euonymus and roses in a suspension of cells of strain 84, a non-pathogenic strain of A. radiobacter. This organism produces an antibotic called agrocin 84 that selectively inhibits most pathogenic agrobacteria (3). There are, however, some strains of A. tumefaciens (especially those that cause crown gall on grapevine) that are not sensitive to the bacterium.

The crown gall organism can become established in the soil and remain there for many years. Rogue diseased plants, being sure to remove all the root material. To control the organism in field or nursery soil, methyl bromide 677 at 270-650 lb/a or methyl bromide 987 at 180-435 lb/a is cleared for use on non-food crops.

When crown gall is infecting container-grown plants, it is best to rogue diseased plants. Tools used for pruning should be surface-sterilized between each plant with 70% alcohol or 10% Clorox to help prevent disease spread.

Literature Cited

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